

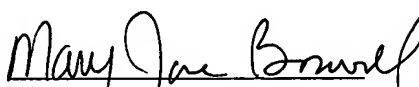
Conclusion

Prior to an examination of the application on the merits, Applicants respectfully request entry of this preliminary amendment. Claims 1-17 have been amended to place the claims into standard format, as well as to correct grammatical and idiomatic errors. Applicants respectfully submit that the changes to the claims have not been made for any reason of patentability and do not narrow the scope of the claims. Thus, Applicants do not intend to relinquish any subject matter by these amendments.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attachment is captioned “Version with markings to show changes made.”

If there are any other fees due in connection with the filing of this paper, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully Submitted,

By: 
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 1 has been amended as follows:

1.(Amended) A test pattern for measuring a contact resistance, comprising:

a test wafer in which a plurality of device isolation films are formed to define a plurality of active regions;

a plurality of interconnection diffusion layers formed in a word line region crossing the plurality of ~~{the}~~ device isolation films and the plurality of ~~{the}~~ active regions;

a plurality of source diffusion layers formed in a first line contact region located at a first ~~{one}~~ side of the ~~{said}~~ word line region;

a plurality of source diffusion layers formed in a second line contact region located at a second ~~{the other}~~ side of the ~~{said}~~ word line region; and

a plurality of line contact patterns ~~{pattern}~~ formed in the ~~{said}~~ first and second line contact regions,

wherein the ~~{said}~~ line contact patterns ~~{pattern}~~ formed in the ~~{said}~~ first line contact region and the ~~{said}~~ line contact patterns ~~{pattern}~~ formed in the ~~{said}~~ second line contact region are alternately positioned, and ~~{wherein}~~ current for measuring a resistance flows along the ~~{said}~~ first line contact region and the ~~{said}~~ second line contact region between the ~~{said}~~ word line in three dimensions ~~{a three dimensional manner}~~.

Claim 2 has been amended as follows:

2.(Amended) The test pattern according to ~~{for measuring a contact resistance as claimed in}~~ claim 1, wherein the ~~{said}~~ word line region, the ~~{said}~~ first line contact region, and the ~~{said}~~ second line contact region are juxtapositioned.

Claim 3 has been amended as follows:

3.(Amended) The test pattern according to ~~{for measuring a contact resistance as claimed in}~~ claim 1, wherein the ~~{said}~~ source diffusion layer in the ~~{said}~~ first line contact region and the ~~{said}~~ source diffusion layer in the ~~{said}~~ second line contact region are electrically connected by an interconnection diffusion layer in the ~~{said}~~ word line region.

Claim 4 has been amended as follows:

4.(Amended) The test pattern according to ~~{for measuring a contact resistance as claimed in}~~ claim 1, wherein one of the plurality of ~~{the}~~ line contact patterns in the ~~{said}~~ first line contact region electrically connects two of the plurality of ~~{the}~~ source diffusion layers in the ~~{said}~~ first line contact region and is electrically isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact patterns ~~{pattern}~~.

Claim 5 has been amended as follows:

5.(Amended) The test pattern according to ~~{for measuring a contact resistance as~~
~~claimed in}~~ claim 1, wherein one of the plurality of ~~{the}~~ line contact patterns in the
~~{said}~~ second line contact region electrically connects two of the plurality of ~~{the}~~
source diffusion layers in the ~~{said}~~ second line contact region, and is electrically
isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact
patterns ~~{pattern}~~.

Claim 6 has been amended as follows:

6.(Amended) A method of manufacturing a test pattern for measuring a contact
resistance, comprising:

forming a plurality of device isolation films in a test wafer ~~{wager}~~ to define
a plurality of active regions;

~~{performing an impurity ion implantation process to}~~ simultaneously ~~{form}~~
forming a plurality of source diffusion layers ~~{layer}~~ in ones of the ~~{a}~~ plurality of
active regions of a first line contact region, a plurality of ~~{an}~~ interconnection
diffusion layers ~~{layer}~~ in ones of the ~~{a}~~ plurality of active regions of a word line,
and a plurality of source diffusion layers ~~{layer}~~ in ones of the ~~{a}~~ plurality of active
regions of a second line contact region;

forming a word line surrounded by an insulating film spacer in the ~~{said}~~
word line region;

forming an insulating layer ~~[the surface of which is flattened]~~ on an ~~[the]~~ entire structure including the ~~[said]~~ word line, the insulating layer having a flattened surface;

forming a self-aligned contact mask on the ~~[said]~~ insulating layer; and

forming a plurality of line contact patterns in the ~~[said]~~ first and second line contact regions through a self-aligned contact process using the ~~[said]~~ self-aligned contact mask,

wherein the ~~[said]~~ line contact pattern formed in the ~~[said]~~ first line contact region and the ~~[said]~~ line contact pattern formed in the ~~[said]~~ second line contact region are alternatingly ~~[alternately]~~ positioned, and current for measuring a resistance flows along the ~~[said]~~ first line contact region and the ~~[said]~~ second line contact region between the ~~[said]~~ word line in three dimensions ~~[a three-dimensional manner]~~.

Claim 7 has been amended as follows:

7.(Amended) The method according to ~~[of manufacturing a test pattern for measuring a contact resistance as claimed in]~~ claim 6, wherein the ~~[said]~~ word line region, the ~~[said]~~ first line contact region, and the ~~[said]~~ second line contact region are juxtapositioned crossing the plurality of ~~[the]~~ device isolation films and the plurality of ~~[the]~~ active regions.

Claim 8 has been amended as follows:

8.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 6, wherein one of the plurality of ~~{said}~~ source diffusion layers ~~{layer}~~ in the ~~{said}~~ first line contact region and one of the plurality of the ~~{said}~~ source diffusion layers ~~{layer}~~ in the ~~{said}~~ second line contact region are electrically connected by one of the plurality of ~~{an}~~ interconnection diffusion layers ~~{layer}~~ in the ~~{said}~~ word line region.

Claim 9 has been amended as follows:

9.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 6, wherein one of the plurality of ~~{the}~~ line contact patterns in the ~~{said}~~ first line contact region electrically connects two of the plurality of ~~{the}~~ source diffusion layers in the ~~{said}~~ first line contact region and is electrically isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact patterns ~~{pattern}~~.

Claim 10 has been amended as follows:

10.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 6, wherein one of the plurality of ~~{the}~~ line contact patterns in the ~~{said}~~ second line contact region electrically connects two of the plurality of ~~{the}~~ source diffusion layers in the ~~{said}~~ second line contact region, and is electrically isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact patterns ~~{pattern}~~.

Claim 11 has been amended as follows:

11.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 6, wherein the ~~{said}~~ self-aligned contact mask is formed to cover an upper portion of the ~~{said}~~ word line, an upper portion of the ~~{a portion of said}~~ device isolation film between a first one of the plurality of ~~{said first}~~ source diffusion layers ~~{layer}~~ and a second one of the plurality of ~~{said second}~~ source diffusion layers ~~{layer}~~ in the ~~{said}~~ first line contact region, and an upper portion of the ~~{a portion of said}~~ device isolation film between the second one of the plurality of ~~{said second}~~ source diffusion layers ~~{layer}~~ and a third one of the plurality of ~~{said third}~~ source diffusion layers ~~{layer}~~ in the ~~{said}~~ second line contact region.

Claim 12 has been amended as follows:

12.(Amended) A method of manufacturing a test pattern for measuring a contact resistance, comprising:

forming a plurality of device isolation films in a test wafer to define a plurality of active regions;

forming ~~[performing a threshold voltage ion implantation process to form]~~ a threshold voltage ion implantation region in the plurality of ~~[the]~~ active regions in a word line region;

forming a word line in the ~~[said]~~ word line region;

forming a plurality of ~~[performing an impurity ion implantation process to form a]~~ source diffusion layers ~~[layer]~~ in each of the plurality of ~~[the]~~ active regions of a first line contact region; ~~[and]~~

forming a plurality of ~~[a]~~ source diffusion layers ~~[layer]~~ in each of the plurality of ~~[the]~~ active regions of a second line contact region;

forming an insulating film spacer surrounding the ~~[said]~~ word line;

forming an insulating layer ~~[the surface of which is flattened]~~ on an ~~[the]~~ entire structure including the ~~[said]~~ word line, the insulating layer having a flattened surface;

forming a self-aligned contact mask on the ~~[said]~~ insulating layer; and

forming a plurality of line contact patterns in the ~~[said]~~ first and second line contact regions through a self-aligned contact process using the self-aligned contact mask,

wherein the {said} line contact pattern formed in the {said} first line contact region and the {said} line contact pattern formed in the {said} second line contact region are alternatingly {alternately} positioned, and current for measuring a resistance flows along the {said} first line contact region and the {said} second line contact region between the {said} word line in three dimensions {a three-dimensional manner}.

Claim 13 has been amended as follows:

13.(Amended) The method according to {of manufacturing a test pattern for measuring a contact resistance as claimed in} claim 12, wherein the {said} word line region, the {said} first line contact region, and the {said} second line contact region are juxtapositioned crossing the plurality of {the} device isolation films and the plurality of {the} active regions.

Claim 14 has been amended as follows:

14.(Amended) The method according to {of manufacturing a test pattern for measuring a contact resistance as claimed in} claim 12, wherein the plurality of source diffusion layers {layer} in the first line contact region and the plurality of source diffusion layers {layer} in the second line contact region are electrically connected by a channel formed in the {a} threshold voltage ion implantation region by applying a voltage to the word line in the {said} word line region.

Claim 15 has been amended as follows:

15.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 12, wherein one of the plurality of ~~{the}~~ line contact patterns in the ~~{said}~~ first line contact region electrically connects two of the plurality of ~~{the}~~ source diffusion layers in the ~~{said}~~ first line contact region, and is electrically isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact patterns ~~{pattern}~~.

Claim 16 has been amended as follows:

16.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 12, wherein one of the plurality of ~~{the}~~ line contact patterns in the ~~{said}~~ second line contact region electrically connects two of the plurality of ~~{the}~~ source diffusion layers in the ~~{said}~~ second line contact region, and is electrically isolated ~~{isolated/positioned}~~ from another one of the plurality of line contact patterns ~~{pattern}~~.

Claim 17 has been amended as follows:

17.(Amended) The method according to ~~{of manufacturing a test pattern for measuring a contact resistance as claimed in}~~ claim 12, wherein the {said} self-aligned contact mask is formed to cover an upper portion of the {said} word line, an upper portion ~~{of a portion}~~ of the {said} device isolation film between a {said} first one of the plurality of source diffusion layers {layer} and a {said} second one of the plurality of source diffusion layers {layer} in the {said} first line contact region, and an upper portion ~~{of a portion}~~ of the {said} device isolation film between the {said} second one of the plurality of source diffusion layers {layer} and a {said} third one of the plurality of source diffusion layers {layer} in the {said} second line contact region.